CHAPTER 143
TRAFFIC SIGNAL SYNCHRONIZATION

761—143.1(364) Definitions. The following definitions apply to these rules:

"Arterial street" means any U.S. or state numbered route, controlled access highway, or other major street or highway designated by the city within its respective jurisdiction as a part of a major arterial system of streets or highways.

"Controller" means a supervisory device that controls the sequence and duration of indications displayed by traffic signals. Types of controllers:

1. *"Actuated controller"* means a controller for supervising the operation of traffic signals in accordance with the varying demands of traffic as registered with the controller by detectors or push buttons. Types of actuated controller operations:

- *"Full-actuated operation"* means traffic demands are registered with the controller by detectors placed on all approaches to the intersection.
- *"Pedestrian-actuated operation"* means pedestrian timings or phases may be added to or included in the cycle by actuation of pedestrian detectors (push buttons).
- *"Semiactuated operation"* means traffic demands are registered with the controller by detectors placed on one or more, but not all, approaches to the intersection.
- *"Volume-density operation"* means full-actuated operation with the ability to reduce the right-of-way time assigned to each vehicle on the basis of the waiting time of opposing vehicles (gap reduction).

2. *"Pretimed controller"* means a controller for supervising the operation of traffic signals that uses preset, fixed cycle lengths; all preset phases are displayed during each cycle.

"Coordination" means the establishment of a definite timing relationship between adjacent traffic signals.

"Cycle" means any complete sequence of traffic signal indications (phases).

"Cycle length" means the time required for one complete cycle.

"Detector" means a device that senses vehicular or pedestrian demand and transmits an impulse to a controller.

"Isolated intersection" means a signalized intersection with a controller whose operation is unaffected by any other controller or supervisory device.

"Local controller" means a controller supervising the operation of traffic signals at a single or two closely spaced intersections.

"Master controller" means a controller supervising the operation of several local controllers.

"Phase" means a portion of the cycle during which an assignment of right-of-way is made to a traffic movement or combination of traffic movements.

"Traffic signal" means any permanently installed, electrically powered traffic control device by which traffic is alternately directed to stop and to proceed.

"Traffic signal system" means two or more traffic signals operating in a coordinated manner. Types of coordinated systems:

1. *"Computerized system"* means a system in which controllers are supervised by a computer.
2. *"Interconnected master-controlled system"* means a system in which local controllers are supervised by a master controller through a communications link (wire/radio). The master establishes a base line condition; the local then operates its intersection in a predetermined relationship with the base line.
3. *"Noninterconnected system"* means a system in which timing relationships between individual local controllers are coordinated by manual settings, without physical interconnection between the controllers.

4. *"Time-based coordinated system"* means a noninterconnected system in which the local controllers use a very accurate programmable digital timing and control device (time-based coordinator) to maintain coordination.

5. *"Traffic responsive system"* means a system in which a master controller specifies cycle timings based on the real time demands of traffic as sensed by vehicle detectors.

761—143.2(364) Applicability. This chapter applies to all cities with more than three traffic signals within the corporate limits.

761—143.3(364) Traffic signal inventory. By July 1, 1991, the cities to which this chapter applies shall submit the following to the Office of Local Systems, Iowa Department of Transportation, 800 Lincoln Way, Ames, Iowa 50010:

143.3(1) A map or listing indicating the location of each traffic signal installation within the corporate limits.

143.3(2) Information about the type of controller operation at each location: full-actuated, pedestrian-actuated, semiactuated, volume-density, or pretimed. For inventory purposes, "pedestrian-actuated" includes only those signals installed to accommodate pedestrians at school or pedestrian crossings.

143.3(3) A listing of locations included in each traffic signal system or subsystem and the classification of the system: computerized, interconnected master-controlled, noninterconnected, time-based coordinated, traffic responsive or, if none of the preceding apply, a description of the classification being used.

761—143.4(364) Required synchronization.

143.4(1) Unless a traffic engineering study documents that it is not practical, traffic signals within one-half mile of each other along an arterial street or in a network of intersecting arterial streets shall be operated in coordination; preferably in a computerized, interconnected master-controlled, time-based coordinated, or traffic responsive system.

143.4(2) Reserved.

143.4(3) Timing and operational plans developed for traffic signals shall be developed by application of traffic engineering principles to provide maximum traffic flow efficiencies and safety.

143.4(4) All traffic signal installations and operations shall meet the requirements of the "Manual on Uniform Traffic Control Devices for Streets and Highways," as adopted in 761—Chapter 130, Iowa Administrative Code.

761—143.5(364) Reporting requirements.

143.5(1) *Cities*. By July 1, 1992, each city to which this chapter applies shall furnish to the office of local systems, at the address listed in rule 143.3(364), an affidavit certifying one of the following:

a. The city is in compliance with the requirements of this chapter and Iowa Code section 364.24.

b. The city has adopted a program to achieve compliance with the requirements of this chapter and Iowa Code section 364.24.

143.5(2) *Department*. By September 1, 1992, the department shall report to the governor and the general assembly those cities that have submitted affidavits and the types of certifications made.

This chapter is intended to implement Iowa Code section 364.24.

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CHAPTERS 144 to 149
Reserved